

GHRC UWG Report from the Onsite Meeting November 13-14, 2018

National Space Science & Technology Center,
The University of Alabama in Huntsville
Huntsville, Alabama

EXECUTIVE SUMMARY

The User Working Group (UWG) for the Global Hydrology Resource Center (GHRC) Distributed Active Archive Center (DAAC) convened at the University of Alabama in Huntsville for its annual onsite meeting from November 13th to November 14th, 2018. The purpose of this meeting was to review the progress that the GHRC has made towards meeting the formal goals and non-binding “suggestions” defined by the UWG during previous onsite meetings, and to provide additional feedback on continuing and planned GHRC programs and activities.

A clear theme emerged within the UWG discussion over the course of the day-and-a-half meeting, which is the necessity for the GHRC to clearly define its vision for the next five to ten years in the form of a strategic plan. This has been suggested in previous UWG reports, but the effort to establish the GHRC as the first cloud-based DAAC by the end of FY19 introduces a new urgency for this recommendation. The cloud migration calls into question the traditional role of a DAAC as a custodian of NASA data. It is imperative that the GHRC leadership work with NASA headquarters and the UWG to anticipate how the DAAC mission should change under the cloud paradigm where resources are held by an external centralized entity, and the walls separating the 12 NASA DAACs are expected to thin as enterprise solutions become prominent. The GHRC leadership needs to establish a vision that will allow the GHRC DAAC to remain relevant as a repository of knowledge and a provider of data services in its focus areas of hazardous weather and the hydrologic cycle, and to maintain its leadership role as an innovator among the NASA DAACs.

The UWG recognizes the value of ongoing collaboration between the GHRC and the UWG throughout the year. Given the scale of the task of creating the strategic plan, the UWG encourages the GHRC to continue engaging the UWG between the annual onsite meetings, as they have done through the webinars and micro-articles that were produced in FY17-18.

The UWG proposes three changes to the structure of future UWG meetings to facilitate discussion and collaboration with the GHRC. The first proposed change is to supplement the annual onsite meeting with at least one virtual meeting to be held no earlier than February 2019. This virtual meeting will provide the UWG an opportunity to respond to feedback gained during the annual meetings of the primary professional societies that represent the GHRC focus areas (the American Meteorological Society, and the American Geophysical Union), will allow the UWG to assess the progress of the GHRC towards addressing the recommendations in this report before the FY19 onsite meeting, and will enable new UWG members to be trained before the FY19 onsite meeting. The second proposed change to the UWG committee structure is to intersperse presentation and discussion sessions throughout the annual 1.5 day onsite meeting. Finally, the UWG proposes opening the closed-door session during the second day of the onsite meeting to the GHRC leadership to facilitate discussion on future annual reports.

There are no UWG member terms expiring before the FY19 onsite meeting and thus no replacements are expected. Pierre Kiretter [NOAA / NSSL] will replace Michael Peterson [

LANL] as UWG chair and Joe Munchak [NASA / GSFC] has been selected as co-chair and incoming chair for FY20.

1. MEETING REPORT

The FY18 onsite UWG meeting followed the structure of previous onsite meetings. During the first full day of the meeting, the GHRC documented their accomplishments from the previous year and their progress towards addressing the FY17 recommendations by the UWG. The afternoon session also included a group activity where the UWG was asked to brainstorm ideas for attracting relevant and quality NASA datasets organically. The UWG convened for a closed-door session on the second half day of the onsite meeting where it became clear that dialogue with the GHRC leadership would be necessary for the DAAC to meet the recommendations that the UWG was settling on. Thus, the UWG invited the GHRC staff to participate in the last half hour of discussion where the UWG finalized its recommendations.

Table 1. 2018 GHRC DAAC User Working Group Board Members

| <i>Discipline</i> | <i>Name</i> | <i>Affiliation</i> | <i>contact</i> | <i>Term end</i> |
|------------------------------------|---|---|--|-----------------|
| Lightning | Steve Goodman Michael Peterson** <i>Weixin Xu</i> | NOAA U Md / NOAA CI for Clim&Sat Colorado State University | steven.j.goodman@noaa.gov michaeljp24@gmail.com wxinxu@atmos.colostate.edu | 2021 |
| Passive Microwave | Joe Munchak <i>Joe Turk</i> | NASA GSFC NASA JPL | s.j.munchak@nasa.gov Joseph.Turk@jpl.nasa.gov | 2021 |
| Hurricane Science | Haiyan Jiang Jonathan Zawislak Jason Dunion | FIU FIU, UMiami/CIMAS,HRD Univ. Miami/CIMAS,HRD | hajiang@fiu.edu jzawisla@fiu.edu jason.dunion@noaa.gov | 2020 2019 |
| Global Precipitation Mission | Dan Cecil Ana Barros Pierre Kirstetter* | NASA MSFC Duke University Univ of Oklahoma | daniel.j.cecil@nasa.gov barros@duke.edu pierre.kirstetter@noaa.gov | 2020 2020 |
| Severe Weather | Emily Berndt | NASA SPoRT | emily.b.berndt@nasa.gov | 2020 |
| Applications | Eric Anderson Dave Jones <i>Bob Brakenridge</i> | NASA MSFC (SERVIR) StormCenter Communications University of CO Boulder | eric.anderson@nasa.gov dave@stormcenter.com robert.brakenridge@colorado.edu | 2021 |
| HQ (ex officio) | Ramesh Kakar Kevin Murphy | NASA HQ NASA HQ | | |
| ESDIS (ex officio) | Jeanne Behnke Drew Kittel Steve Berrick | NASA GSFC NASA GSFC NASA GSFC | | |

**2018 Chair, *2018 Co-Chair; *italic* = members added in 2018

2. DISPOSITION OF PREVIOUS RECOMMENDATIONS

The UWG recognizes the progress that the GHRC has made in addressing the recommendations made during the FY17 onsite meeting. After discussing the current status of the open recommendations from FY17, the UWG kept the former Recommendation 1 as an open issue and decided that the unresolved aspects of the former Recommendations 2 – 3 could be described as specific cases of the lack of a 5 – 10 year strategic plan. Thus, in the disposition of recommendations from FY17 summarized in Table 2, the UWG moved to propagate a modified FY17 Recommendation 1 and merge FY17 Recommendation 2 and 3 into the new FY18 Recommendation 1. The UWG also moved to close FY17 Recommendation 4.

Table 2. Disposition of recommendations from FY17 GHRC UWG onsite meeting.

| <i>Recommendation</i> | <i>Description</i> | <i>Disposition</i> |
|------------------------------|--|------------------------------|
| 1 | NASA Headquarters, the Weather Focus Area of the Earth Sciences Division, Applied Sciences Division, and the GHRC UWG should work with GHRC to provide strategic advice and support on creating a 5 and 10 year plan that improves the link between the mission of the GHRC, its data holdings, and potential applications. This should also involve more engagement between the GHRC and UWG members throughout the year (e.g., webinars with focus area representatives on the UWG). | Open – New Recommendation 1 |
| 2 | Data sets related to the validation of NASA-sponsored precipitation products are critical to both assessing and improving satellite products. The UWG should work with the GHRC to identify critical missing data elements in their holdings as well as data sets that would both help in validation efforts and be of great use to the end user community. | Merge – New Recommendation 1 |
| 3 | GHRC should pursue/develop a plan to become an event-driven repository for major hydrometeorological events (i.e., Hurricane Harvey) to provide a bundled set of datasets that enable researchers to analyze the event. GHRC should also pursue opportunities to submit supplemental funding requests (e.g., “Harvey”) through NASA to identify and collect relevant datasets. | Merge – New Recommendation 1 |
| 4 | Determine the possibility of getting land data from SWOT mission at the GHRC to complement hazardous weather related to floods caused by excess precipitation. This would complement other flood and extreme event (including precipitation) data sets. | Close |

3. DISPOSITION OF PREVIOUS SUGGESTIONS

In addition to providing actionable recommendations for the GHRC, the UWG defined “suggestions” at the FY17 annual onsite meeting to recognize GHRC efforts that were met but

require periodic updates due to their ongoing nature. Suggestions thus carry less weight than recommendations where there was an expectation of a significant deliverable for the FY18 meeting.

Four suggestions were put forward by the UWG at the FY17 meeting, which are summarized in Table 3. The UWG challenged the GHRC in Suggestion 1 to extent outreach efforts beyond the primary annual meetings for its focus area – AMS and AGU – and to consider non-traditional outreach opportunities such as exhibitor booths. The GHRC is clearly making progress on this suggestion despite the irregular meeting schedules in certain swaths of the potential user community (i.e., reinsurance was specifically mentioned) have posed a challenge. The UWG wishes to remain informed of GHRC efforts in this area, and thus move to keep the suggestion open for the FY19 meeting.

The remaining suggestions revolve around ongoing technology development and implementation at the GHRC. Per Suggestion 2, the GHRC had started to add advanced user metrics to their web software including the Google Analytics suite that was specifically mentioned in the FY17 report. It remains to be seen to what level the user experience will be captured as the GHRC continues to build expertise with the GA suite collects analytics data over multiple years. The UWG encourages the GHRC to continue working on the end-to-end aspect of tracking the user experience. One example would be to monitor what data have been published according to the dataset DOI. The UWG would like to see a survey that queries users on tools that might be beneficial for future migration of analyses to the cloud alongside the data. Understanding user workflows would help to avoid excessive downloading of data and could also benefit the selection of topics for data recipes, micro articles, and other services.

Suggestions 3 and 4 request updates on the development of the GHRC DAPPeR tool for data publishing and the VISAVE and FCX tools for data visualization. The development of these software products is a multi-year project that may face hurdles as well as growth opportunities as the GHRC migrates its data holdings to the cloud. The UWG moved to keep Suggestions 2 – 4 open to monitor the progress of these initiatives over the coming year.

Table 3. Disposition of suggestions from FY17 GHRC UWG onsite meeting.

| <i>Suggestion</i> | <i>Description</i> | <i>Disposition</i> |
|--------------------------|---|---------------------------|
| 1 | Extend outreach efforts beyond meteorological meetings. Carefully consider, survey, select and focus on topical professional meetings. Focus on more than just presentations and consider exhibitor booths. | Open |
| 2 | Explore adding advanced, impact-based user metrics that are more informative as to the end-to-end user activity. | Open |
| 3 | Provide an update at the 2018 UWG meeting on the progress and usage of DAPPeR. | Open |
| 4 | Continue to provide updates on VISAGE and the development of FCX tools. | Open |

4. NEW UWG RECOMMENDATIONS FOR FY2018

Recommendation 1 (previously Recommendation 1): The imminent migration of the GHRC data holdings to the cloud adds urgency to the need for the GHRC to create a 5 and 10 year plan. These plans should establish a clear vision for the role of the GHRC in the cloud era that will enable the DAAC to maintain a sustainable niche within the enterprise paradigm enabled by the cloud. The UWG encourages the GHRC to seek advice from NASA Headquarters, the Weather Focus Area of the Earth Sciences division, Applied Sciences Division, and the GHRC UWG to ensure that these strategic plans align with the future direction of NASA data (i.e., earthdata search) and NASA research (i.e., the decadal survey) and resonate with the needs of the current GHRC user community as well as hazardous weather user communities that the GHRC wishes to attract.

The migration of the GHRC data holdings to the cloud is unprecedented among the NASA DAACs, which places the GHRC in a position of leadership for the development of cloud-based and eventually enterprise software solutions that can be run coincident with the data. However, this migration calls into question the traditional role of a NASA DAAC as a custodian of program data. As more DAACs follow the GHRC into the cloud, the walls between their data holdings will thin. It will become a challenge to maintain the sense of identity between the topic-based DAACs if their visions do not evolve to thrive in this cloud environment. The UWG recommends that the GHRC take advantage of NASA-wide meetings (i.e., during AGU) to work with the other DAACs and NASA Headquarters to define what a DAAC should be in the cloud era and prepare a report on this vision for the UWG.

The GHRC has positioned itself well to become a leader in value-added data services, but the GHRC leadership should consider the future of the broad GHRC brand and the severe weather userbase. The issue of GHRC branding revisits the discussion during the FY17 UWG meeting where it was suggested that the term “Hydrology” in GHRC may not fully encapsulate the severe weather phenomena that the GHRC is known for. This discussion was ultimately not refined into a recommendation during the 2017 meeting, but may be worthwhile in the context of planning the 5 to 10 year vision of the GHRC. “Hydrometeorology” was suggested as a possible alternate term that would not change the acronym, as even lightning is ultimately the result of hydrometeorological processes.

The issue of branding also includes data recipes, micro-articles, and other value-added data knowledge products that are distributed by the GHRC. The DAAC should consider what users will recognize the GHRC for once the data are physically hosted by an external corporate system. Expertise and data services are one example. Translation of data granules into GIS products that would enable broader access across user communities (i.e., decision makers) and external application development may be another. Branding decisions should be aligned with then future of NASA data holdings and how users discover possible datasets of interest (i.e., enterprise search tools). The GHRC should pay attention to large NASA projects such as the decadal survey and curate data within its focus areas that could support such missions (i.e., in data bundles or virtual collections). Opportunities for collaboration with other institutions that host data related to water issues should be explored, particularly the NASA JPL Western Water Applications Office. Water-related data bundles and virtual collections would not only tie the GHRC to hydrology, but also round out its lightning-heavy data holdings. It was also suggested that the GHRC build on the success of the lightning virtual collection to extend the concept to other focus areas such as precipitation, and also to new types of central topic such as a given instrument type or aircraft, or for specific events such as a major hurricane.

The UWG anticipated the need for the GHRC to become an event-driven repository for major hydrometeorological events during the FY17 meeting (Recommendation 2). To this end, the GHRC has prototyped the REACT tool that provides a subscription service where users can specify the types of events that they are interested in and receive data bundles (called “albums” in the REACT terminology) when such an event is added to the GHRC data holdings. This tool has significant promise, particularly in the cloud paradigm if it could be integrated with the Common Metadata Repository or even the data at the granule level to provide a robust set of “event” definitions. For example, a passive microwave scientist may set an event for new aircraft data coming available with microwave radiometer measurements. The UWG recommends that the GHRC continues to support its development. Tagging data by name in cases of named events would be beneficial for search capabilities. With additional development, the UWG anticipates that a cloud-based tool like REACT could be a GHRC product that diffuses over to other DAACs.